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**Automation**  
**Robohand FERGUSON**  
**CAMCO**

## Installation & Operation Manual

### CAMCO eSwitch Programmable Limit Switch

*Part No: 87C91663000000*



#### **WARNING**

This is a controlled document. It is your responsibility to deliver this information to the end user of this DE-STA-CO CAMCO product. Failure to deliver this could result in your liability for injury to the user or damage to the machine. For copies of this manual, call your Customer Service Representative at 800-645-5207



# CAMCO eSwitch Programmable Switch

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DE-STA-CO  
CAMCO Products  
www.destco.com  
888-DESTACO (888-337-8226)

## Introduction

This service manual describes the setup and operation of the CAMCO eSwitch. The eSwitch is a programmable multi-channel switch used to signal rotary position for accurate timing of component operation.

### ***Warnings & Cautions***

Statements in this manual preceded by the words WARNING or CAUTION and printed in italics are very important. We recommend you take special notice of these during service or repair. [see camtronics book for example of warnings and cautions]

#### ***WARNING***

Means there is a possibility of personal injury to yourself or others

#### ***CAUTION***

Means there is a possibility of damage to the CAMCO product.

## Operating Principle

The eSwitch communicates the rotary position of a shaft to time various component operations. It has 8 channels (outputs) with 4 positions per channel. Each channel can be used to signal one component.

For instance, the eSwitch is mounted on the input of a Linear Parts Handler. Channel 1 signals the dwell positions of the Parts Handler (home, pick dwell, place dwell) and channel 2 signals to a gripper mounted to the parts handler when to open and close.

The eSwitch sends a signal of 24V.

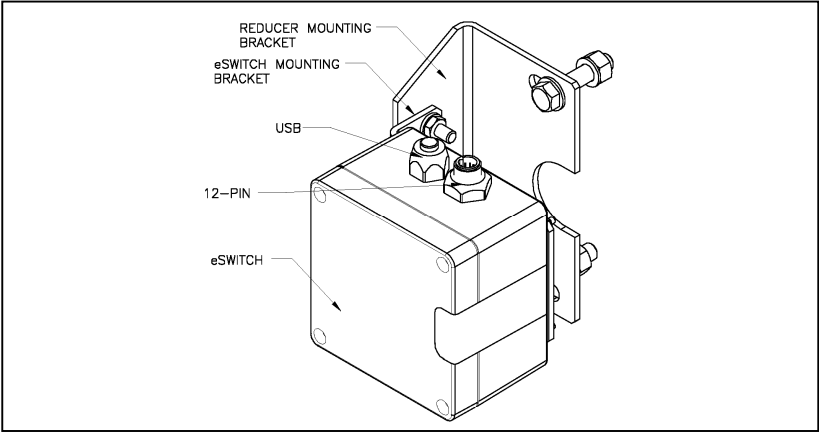
### ***Requirements***

- PC with Windows 2000 or newer and a USB port
- USB 5-pin Mini-USB cable (similar to the cable for digital cameras)
- 12-pin Power and Data Cable
- 24V Power Supply

### ***Specifications***

- Maximum Shaft Operating Speed: 180 RPM
- Enclosure Rating: IP66 / NEMA 4, 4x (watertight)

# eSwitch Mounting Parts

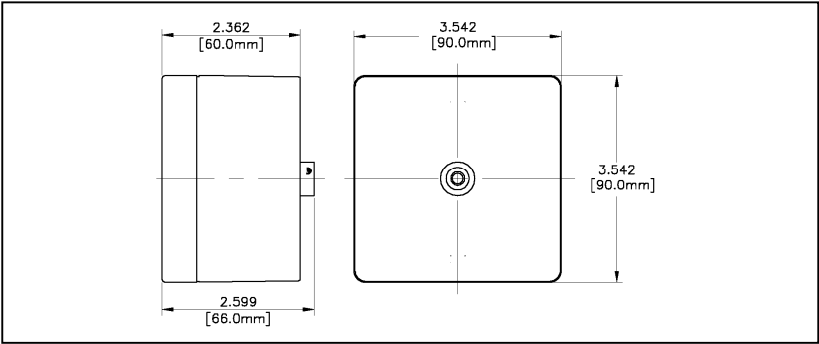


## Part Numbers

Description	DE-STA-CO Part No.	Supplier Part No
eSwitch	87C91663000000	-
12-Pin Cable (2-meter length)*	87A92671010000	Turck RKC12T-2
12-Pin Cable with Stainless Steel Nut (2-meter length) *	87A92671050000	Turck RKC12T-2
mini USB Cable (6-ft length)*	87A92672010000	Belkin F3U138-06-GLD

\* Other lengths available, contact DE-STA-CO for more information

## Dimensions



## Installing Software

In order to use the eSwitch you will need to install the application program “eSwitch” and a USB driver.

### ***eSwitch Application Program***

To install the eSwitch program run **setup.exe** on the CD and follow the instructions.

### ***VCP Driver Program***

1. From the CD, run **CP210x\_VCP\_Win\_XP\_S2K3\_Vista\_7.exe** and follow the instructions.

**NOTE:** The eSwitch uses a Silicon Laboratories CP2102 Single-Chip USB to UART Bridge as the configuration interface between the eSwitch and a PC.

The *Virtual Communications Port* (VCP) drivers are provided royalty-free by Silicon Laboratories. The VCP drivers are available for Windows 7, Windows 2000/XP/Server 2003/Vista, Windows CE, Macintosh OS-X and OS-9, and Linux. A copy of the VCP driver for Windows is included on the CD provided with the eSwitch or from the DE-STA-CO website ([www.destco.com](http://www.destco.com))

The latest VCP drivers are also available at <http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>.

2. After the VCP device driver is installed, the PC should recognize the eSwitch when it is connected and power and will automatically assign a COM port.

**Note:** Once Windows has assigned a COM port to the eSwitch, it should assign the same COM port each time the eSwitch is reconnected to the PC. This port is usually COM6. The COM port may then be opened and a connection made, at which point data may be transferred. However, if the eSwitch is disconnected or powered off, then reconnected, the program “eSwitch” must be restarted.

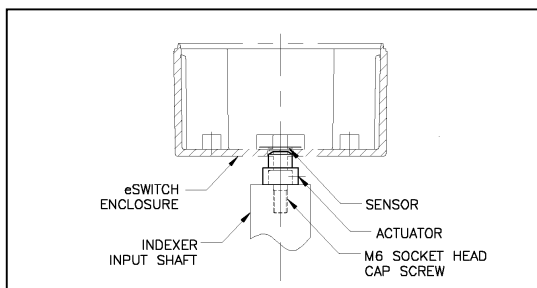
The first time the eSwitch is connected to the PC and powered, Windows will indicate it has found new hardware and will automatically find the drive previously installed from the eSwitch CD. The eSwitch will only be included on the hardware list when it is powered.

## eSwitch Setup

### ***Mount the Actuator***

*If eSwitch is not already mounted*

1. Drill and tap an M6 thread into the center of the timing shaft. Screw an M6 socket head cap screw *firmly* into the tapped hole.
2. Mount the actuator to the socket head cap screw and secure *firmly* with the provided set screw. DE-STA-CO recommends using LOCTITE to secure the set screw.



### ***Mount the eSwitch to the CAMCO unit***

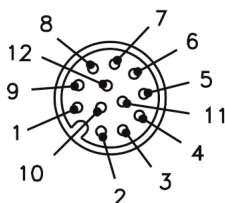
*If eSwitch is not already mounted*

1. Open the clear cover on the eSwitch. Attach the small eSwitch bracket loosely to the back of the eSwitch with the (4) M3 screws and nuts
2. Attach the larger reducer bracket firmly to the gear reducer using 2 screws
3. Use the actuator (attached to the end of the unit input shaft) to locate the eSwitch. Slide the eSwitch over the actuator, until it hits the shoulder (this is a close fit), matching the slots in the eSwitch bracket with the slots in the reducer bracket. Attach the brackets together loosely with the screws and nuts provided.
4. Once the eSwitch is positioned properly relative to the actuator, tighten all screws firmly.

### ***Connect the 12-Pin Cable***

1. Connect the 12-Pin Cable Connector to the eSwitch.
2. The other end of the 12-Pin Cable consists of loose wires and can be connected to the input of the various devices signaled from the eSwitch.

### 3. eSwitch Data Connector Pin Numbers



Data connector pin assignments

Output Name	Data Connector Pin Number	Turck Wire Color *
+24V IN	12	VT (Violet)
COMMON	4	YE (Yellow)
OUT1	7	BU (Blue)
OUT2	6	PK (Pink)
OUT3	5	GY (Gray)
OUT4	11	BK (Black)
OUT5	3	GN (Green)
OUT6	2	BN (Brown)
OUT7	1	WH (White)
OUT8	9	OG (Orange)
-	10	TN (Tan)
-	8	RD (Red)

\* Wire colors are for Turck RKC12T 12-pin cable

**NOTE:** All outputs must connect to **COMMON** to complete the circuit.

### ***Configure the Communication (COM) port settings***

1. Connect the eSwitch to the computer with the USB cable. You will need to provide power to the eSwitch
2. In Windows, open the Control Panel, select System and open the Device manager.



- Under “Ports,” the VCP should be shown as COM6. If it is not 6, note the number shown.

**Note:** If the Com port is not 6, then you must change the text in the file “eswitchcomport.txt” from “6” to the Com port number as noted in step 3. This file is located in the same directory as the program “eSwitch”.

- Configure the communications port with the following settings:

**Baud Rate** 9600 bps

**Data Bits** 8

**Parity** None

**Stop Bits** 1

**Flow Control** None

## Program the eSwitch

**CAUTION:** When programming of the eSwitch is complete, remove the USB cable from the eSwitch and put the blue cover back on the USB port on the eSwitch. Failure to replace the cover could result in damage to the eSwitch.

- Connect the switch to the computer with a USB cable and provide power to the eSwitch
- Run “eSwitch.exe”

DE-STA-CO eSwitch - Version 1.00

Get Values From eSwitch      Get Values From File

Send Values To eSwitch      Send Values To File

**eSwitch Values**

	CW	on	off	on	off	on	off	on	off
Output 1:	0,	90,	120,	180,	-1,	-1,	-1,	-1	
Output 2:	200,	270,	-1,	-1,	-1,	-1,	-1,	-1	
Output 3:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1	
Output 4:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1	
Output 5:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1	
Output 6:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1	
Output 7:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1	
Output 8:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1	

Errors - None

File or Edited Values

Output 1: Sequence 1

ON	0
OFF	90

Sequence 2

ON	120
OFF	180

Sequence 3

ON	-1
OFF	-1

Sequence 4

ON	-1
OFF	-1

Rotation

• CW      • CCW

Set Current Position As Zero or Home

Update Values To Table

## ***Program Window Features***

**Get Values From eSwitch** Pressing this button will copy the values stored in the eSwitch to left tab of the middle two tab section.

**Send Values To eSwitch** Pressing this button permanently record the timings to the eSwitch memory.

**Get Values From File** Pressing this button will open a file dialog box looking for a text file containing an eSwitch configuration.

**Send Values to File** Pressing this button will record an eSwitch configuration to a text file for later use.

**Copy eSwitch Values to File or Edited Values** Pressing this button transfer the eSwitch values for editing.

**Rotation CW / CCW** Pressing this button will set the direction of rotation of the timing shaft.

**Set Current Position As Zero or Home** Pressing this button set the current position of the timing shaft as zero or home.

**Update Values To Table** Pressing this button send the values from the "File or Edited Values" of the middle two tab section to the temporary memory of the eSwitch.

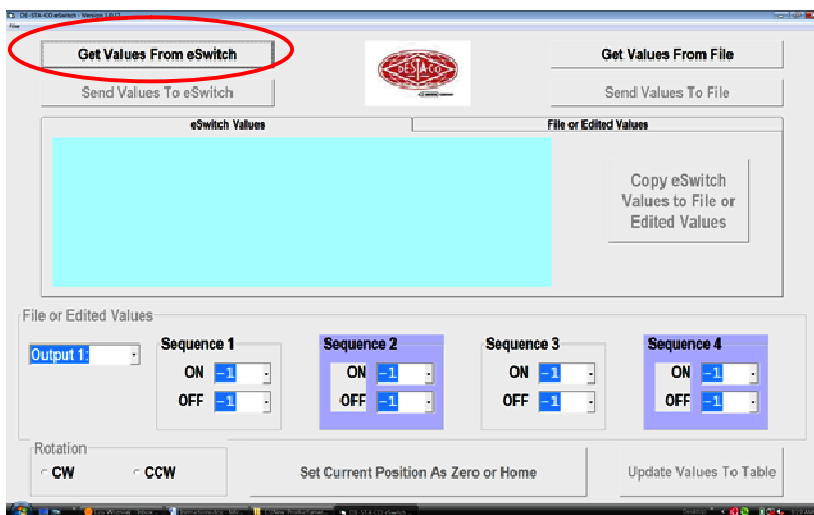
## ***Sample eSwitch configuration text file***

<b>CW</b>	<b>on</b>	<b>off</b>	<b>on</b>	<b>off</b>	<b>on</b>	<b>off</b>	<b>on</b>	<b>off</b>
Output 1:	0,	90,	120,	180,	-1,	-1,	-1,	-1
Output 2:	200,	270,	-1,	-1,	-1,	-1,	-1,	-1
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Output 6:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1
Output 7:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1
Output 8:	-1,	-1,	-1,	-1,	-1,	-1,	-1,	-1

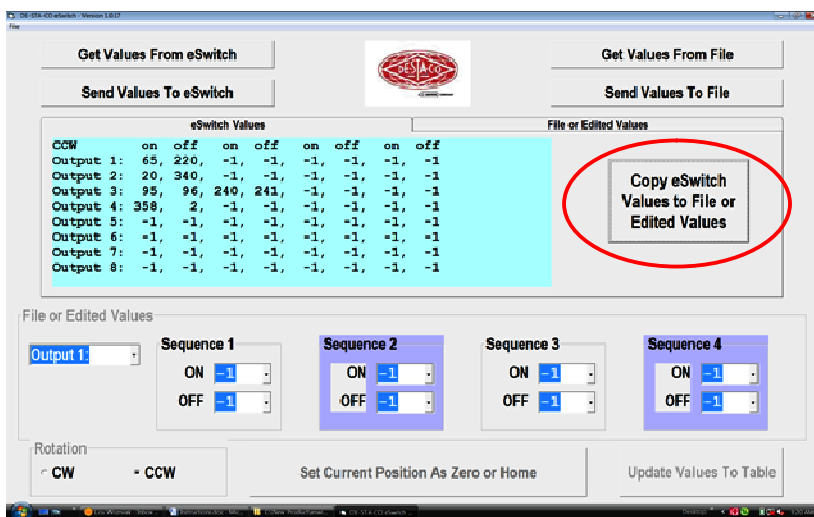
**Note:** A value of -1 indicates the sequence is not being used.

## Example eSwitch Set Up

1. Press **Get Values From eSwitch** (retrieves any existing program) or **Get Values From File** (for new program or program transferred from another eSwitch)



2. Press **Copy eSwitch Values to File or Edited Values**. This transfers the data so it can be edited or transferred to a file.



- Confirm the timing shaft (CAMCO Unit Input Shaft) is turned to the home position. Put it in the home position if it is not.
- Press **Set Current Position as Zero or Home** to set the current shaft position as the home (zero) point for the eSwitch

The screenshot shows the DESTACO software interface. At the top, there are buttons for 'Get Values From eSwitch', 'Send Values To eSwitch', 'Get Values From File', and 'Send Values To File'. Below these is a table of eSwitch Values and a table of File or Edited Values. The 'Set Current Position as Zero or Home' button is circled in red.

eSwitch Values	File or Edited Values																																																																																	
OK 2 Command successful.	<table border="1"> <thead> <tr> <th>CCW</th> <th>on</th> <th>off</th> <th>on</th> <th>off</th> <th>on</th> <th>off</th> <th>on</th> <th>off</th> </tr> </thead> <tbody> <tr> <td>Output 1:</td> <td>65</td> <td>220</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 2:</td> <td>20</td> <td>340</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 3:</td> <td>95</td> <td>96</td> <td>240</td> <td>241</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 4:</td> <td>358</td> <td>2</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 5:</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 6:</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 7:</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> <tr> <td>Output 8:</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> <td>-1</td> </tr> </tbody> </table>	CCW	on	off	on	off	on	off	on	off	Output 1:	65	220	-1	-1	-1	-1	-1	-1	Output 2:	20	340	-1	-1	-1	-1	-1	-1	Output 3:	95	96	240	241	-1	-1	-1	-1	Output 4:	358	2	-1	-1	-1	-1	-1	-1	Output 5:	-1	-1	-1	-1	-1	-1	-1	-1	Output 6:	-1	-1	-1	-1	-1	-1	-1	-1	Output 7:	-1	-1	-1	-1	-1	-1	-1	-1	Output 8:	-1	-1	-1	-1	-1	-1	-1	-1
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File or Edited Values

Output 3:   
 Sequence 1: ON 95, OFF 96  
 Sequence 2: ON 240, OFF 241  
 Sequence 3: ON -1, OFF -1  
 Sequence 4: ON -1, OFF -1

Rotation:   
 CW ☒ CCW ☐ **Set Current Position As Zero or Home**

- Verify the rotation of the timing shaft.
- Select the correct rotation **CW** or **CCW**.

The screenshot shows the DESTACO software interface. At the top, there are buttons for 'Get Values From eSwitch', 'Send Values To eSwitch', 'Get Values From File', and 'Send Values To File'. Below these is a table of eSwitch Values and a table of File or Edited Values. The 'Set Current Position as Zero or Home' button is circled in red.

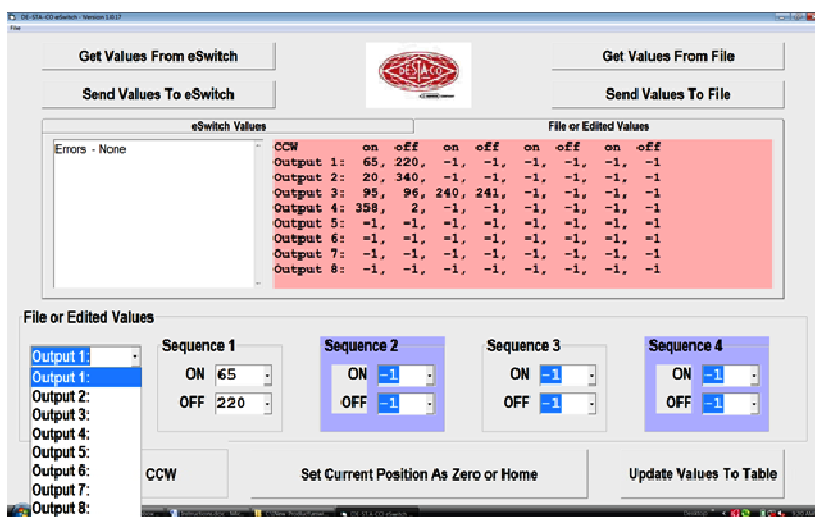
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File or Edited Values

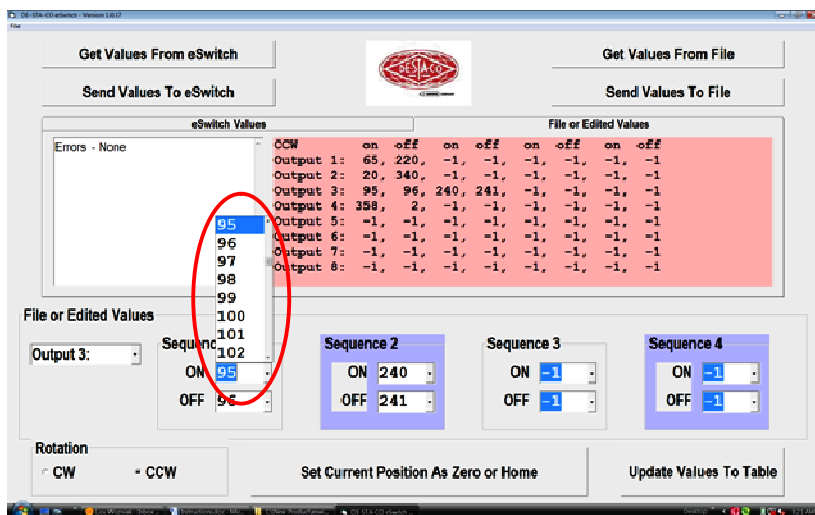
Output 3:   
 Sequence 1: ON 95, OFF 96  
 Sequence 2: ON 240, OFF 241  
 Sequence 3: ON -1, OFF -1  
 Sequence 4: ON -1, OFF -1

Rotation:   
 CW ☐ **CCW** ☒ **Set Current Position As Zero or Home**

## 7. Select the Output channel to be edited



## 8. Change the Sequence or Sequences. Select values for degrees of input rotation for when the channel should turn on and when it should turn off. Each channel can have up to 4 sequence



9. Press **Update Values To Table** to update the Value table with the new sequence values.

The screenshot shows the DESTACO software interface. The 'eSwitch Values' window displays a list of commands: 'OK', 'Z Command successful.', and 'ST Command successful.'. The 'File or Edited Values' window shows a table of values for 8 outputs, with columns for 'on' and 'off' states. The 'File or Edited Values' window also shows four sequences (Sequence 1 to Sequence 4) with 'ON' and 'OFF' values. The 'Rotation' section shows 'CW' and 'CCW' options. The 'Update Values To Table' button is circled in red.

Output	on	off	on	off	on	off	on	off
Output 1:	65	220	-1	-1	-1	-1	-1	-1
Output 2:	20	340	-1	-1	-1	-1	-1	-1
Output 3:	95	96	240	241	-1	-1	-1	-1
Output 4:	358	2	-1	-1	-1	-1	-1	-1
Output 5:	-1	-1	-1	-1	-1	-1	-1	-1
Output 6:	-1	-1	-1	-1	-1	-1	-1	-1
Output 7:	-1	-1	-1	-1	-1	-1	-1	-1
Output 8:	-1	-1	-1	-1	-1	-1	-1	-1

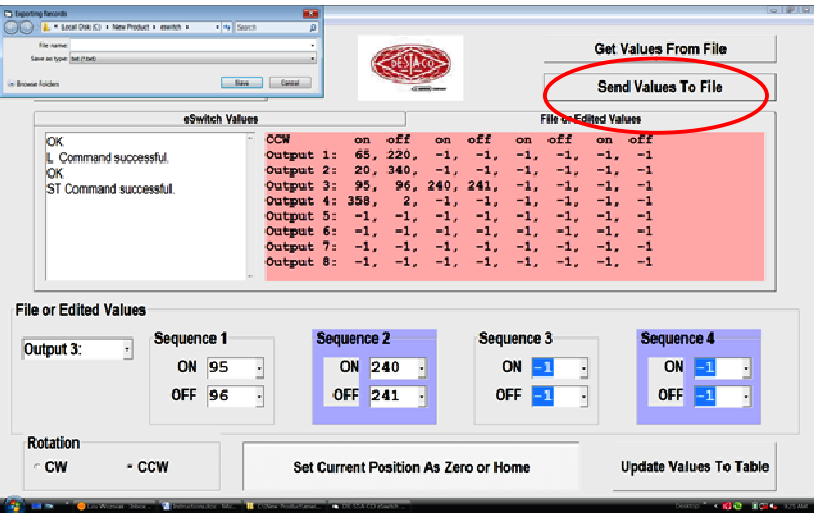
10. Repeat steps 7 through 9 for each channel required

11. Press **Send Values To eSwitch** to save the new values to the eSwitch

The screenshot shows the DESTACO software interface. The 'eSwitch Values' window displays a list of commands: 'OK', 'L Command successful.', 'OK', and 'ST Command successful.'. The 'File or Edited Values' window shows a table of values for 8 outputs, with columns for 'on' and 'off' states. The 'File or Edited Values' window also shows four sequences (Sequence 1 to Sequence 4) with 'ON' and 'OFF' values. The 'Rotation' section shows 'CW' and 'CCW' options. The 'Send Values To eSwitch' button is highlighted.

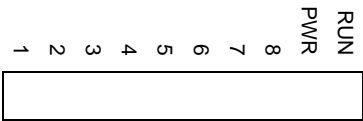
Output	on	off	on	off	on	off	on	off
Output 1:	65	220	-1	-1	-1	-1	-1	-1
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Output 5:	-1	-1	-1	-1	-1	-1	-1	-1
Output 6:	-1	-1	-1	-1	-1	-1	-1	-1
Output 7:	-1	-1	-1	-1	-1	-1	-1	-1
Output 8:	-1	-1	-1	-1	-1	-1	-1	-1

12. Press **Send Values To File** to save the values to a file for backup or for transfer to another eSwitch



13. When programming is complete, click on the “File” menu and select “Exit”.

### eSwitch Lights



Light	On	Off
RUN	eSwitch is powered but not connected to program	eSwitch is connected to program
PWR	eSwitch is powered	eSwitch is not powered
1 – 8	Channel signal is on	Channel signal is off



## **Automation**

**Robohand FERGUSON**

**CAMCO**

### **CAMCO & FERGUSON Products**

1444 South Wolf Road  
Wheeling, IL 60090  
USA

ph: 847-459-5200

toll-free: 800-645-5200

fax: 847-459-3064

camco@destaco.com

www.camcoindex.com

*ISO 9001:2000 Registered*

### **DE-STA-CO Headquarters**

Auburn Hills, Michigan USA

248-836-6700

marketing@destaco.com

[www.destaco.com](http://www.destaco.com)

### **DE-STA-CO Europe**

Germany

+49-6171-705-0

europa@destaco.com

### **DE-STA-CO Asia**

Thailand

+66-2-326-0812

info@destaco.com

### **DE-STA-CO South America**

Brazil

0800-124070

samerica@destaco.com

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